11/06/2002 09/992,387

11jun02 16:02:17 User267149 Session D136.1

SYSTEM:OS - DIALOG OneSearch
File 2:INSPEC 1969-2002/Jun W2
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*File 305: Frequency of updates and Alerts changing to weekly. See HELP NEWS 305.
File 315:ChemEng & Biotec Abs 1970-2001/Dec

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Set     Items   Description
S1        238   AU=(COYLE, A? OR COYLE A?)
S2          0   S1 AND ((BALL()GRID OR LAND()GRID OR PAD()GRID OR PIN()GRI-
              D)(3N)ARRAY? ?)
S3          0   S1 AND (INTEGRAT??????(2N)(CIRCUIT??? OR IC))
S4          0   S1 AND ((COUPL??? OR CONNECT??? OR LINK??? OR JOIN???)(3N)
              (MEMBER? ? OR UNIT? ? OR PART? ?))
S5         31   S1 AND (((THIN()FILM???) OR LAYER??? OR COAT??? OR SUBSTRA-
              T????? OR MATERIAL? ? OR SUBSTANCE? ? OR (UNDERL????(2N)LAYER-
              ???) OR BASE? ?))
S6          0   S5 AND INSULAT?????
S7          0   S5 AND (POLYIMIDE? ? OR (SYNTHETIC? ?(3N)RASIN) OR (POLYME-
              RIC(3N)RASIN? ?) OR (HEAT??? OR WEAR OR CORROSION???)(4N)RESI-
              ST???????)
S8          0   S5 AND ((GOLD OR AU)(2N)(BALL? ? OR BUMP? ?))
S9          0   S5 AND ((SOLDER??? OR FUSIBLE(2N)ALLOY? ? OR BOND???? OR J-
              OIN?????? OR CEMENT????)(2N)(BALL? ? OR BUMP? ?))
S10         0   S5 AND ((COPPER OR CU)(2N)(BALL? ? OR BUMP? ?))
S11         0   S5 AND (FLIP()CHIP OR FLIP()BOND)
S12         0   S5 AND (THERMOSETTING? ? OR THERMOPLASTIC???(3N)(BLEND??? -
              OR MIX OR MIXTURE OR MIXING))
S13         0   S5 AND ENCAPSULAT??????
S14        38   AU=(BUSCHBOM, M? OR BUSCHBOM M?)
S15         0   S14 AND ENCAPSULAT??????
S16         0   S15 AND (THERMO()COMPRESSION??? OR THERMOCOMPRESSION??? OR
              INTERDIFFUSION??? OR INTER()DIFFUSION???)
S17         6   S14 AND (FLIP()CHIP OR FLIP()BOND)
S18         5   S14 AND (TAPE()AUTOMAT???(1N)BONDING OR TAB)
S19         4   S18 NOT S17
S20         0   S14 AND ((GOLD OR AU)(2N)(BALL? ? OR BUMP? ?))
S21         0   S14 AND (POLYIMIDE? ? OR (SYNTHETIC? ?(3N)RASIN) OR (POLYM-
              ERIC(3N)RASIN? ?) OR (HEAT??? OR WEAR OR CORROSION???)(4N)RES-
              IST???????)
S22         0   S14 AND (INTERPOSER? ?)
S23        12   S14 AND (((THIN()FILM???) OR LAYER??? OR COAT??? OR SUBSTR-
              AT????? OR MATERIAL? ? OR SUBSTANCE? ? OR (UNDERL????(2N)LAYE-
              R???) OR BASE? ?))
S24         0   S23 AND ((COUPL??? OR CONNECT??? OR LINK??? OR JOIN???)(3N)
              (MEMBER? ? OR UNIT? ? OR PART? ?))
S25         0   S23 AND (CONTACT????(3N)PAD???)
S26         0   S23 AND ((BALL()GRID OR LAND()GRID OR PAD()GRID OR PIN()GR-
              ID)(3N)ARRAY? ?)
S27         0   S23 AND ((BALL()GRID OR LAND()GRID OR PAD()GRID OR PIN()GR-
              ID)(3N)ARRAY? ?)
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11/06/2002 09/992,387

17/3,AB/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6128157 INSPEC Abstract Number: B1999-02-0170J-083
Title: Reliability data for **flip chip** on flex
Author(s): El-Ghor, M.K.; Blythe, D.; Nguyen, P.; Ding, L.; **Buschbom, M.**; Sadaike, S.; Kinoshita, M.; Masumoto, K.; Watanabe, M.
Author Affiliation: Texas Instrum. Inc., Dallas, TX, USA
Conference Title: Proceedings of the Technical Program. NEPCON West '98. Conference Part vol.3 p.1150-60 vol.3
Publisher: Reed Exhibition, Norwalk, CT, USA
Publication Date: 1998 Country of Publication: USA 3 vol. 1546 pp.
Material Identity Number: XX-1998-02004
Conference Title: Proceedings of NEPCON West 98
Conference Date: 1-5 March 1998 Conference Location: Anaheim, CA, USA
Language: English
Abstract: Advanced developments in interconnect technology are driven by fierce competition in various segments of semiconductor applications. New package schemes evolved to address aggressive requirements set forth by customers. **Flip chip** technology has been accepted generally by the electronics industry only during the past few years as a true solution to many current and future applications. In this work, it is shown that **flip chip** on flex is a reliable technology in hard disk drive applications. Reliability data is presented demonstrating zero failures in dynamic life, thermal cycling, latch-up, electrostatic discharge, protective overcoat integrity, corrosion/delamination, and solder ball shear testing. The reliability data obtained met customer requirements. The parts were thus qualified and used in production. This work demonstrates the high quality of both the bumping process and the assembly process on flex substrates.

17/3,AB/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

5849143 INSPEC Abstract Number: B9804-0170J-040, C9804-5320C-005
Title: Application of **flip chip** in hard disk drive industry
Author(s): El-Ghor, M.K.; **Buschbom, M.**; Thomas, S.; Moore, T.; Masumoto, K.; Okazaki, T.; Masumoto, M.
Author Affiliation: Texas Instrum. Inc., Dallas, TX, USA
Conference Title: SMTA National Symposium, Emerging Technologies. Proceeding of the Technical Program p.113-17
Publisher: Surface Mount Technol. Assoc, Edina, MN, USA
Publication Date: 1997 Country of Publication: USA 197 pp.
Material Identity Number: XX97-02909
Conference Title: Proceedings of 4th Annual New and Emerging Technologies for Surface Mounted Electronic Packaging
Conference Date: 20-23 Oct. 1997 Conference Location: Bloomington, MN, USA
Language: English
Abstract: Inherent advantages of **flip chip** technology for reduction in real estate, providing thin profiles, and improvement in speed and performance, played a key role in its application to several areas such as mainframes, automotive electronics, wireless devices, and hard disk drives. This paper reports on the application of **flip chip** in the hard disk drive industry. An excellent prototype method to evaluate initial bumped products is demonstrated by using stud bumping. In this method, a palladium core with solder stud forms the final interconnect bump between the chip and flex substrate. Structural and reliability data are presented. In production, eutectic solder bumps formed by electroplating using the fountain method are implemented. Structural and chemical characterization of the plated bumps are reported. Finally, issues and recommendations related to the assembly of **flip chip** on flex substrates are discussed.

11/06/2002 09/992,387

17/3,AB/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

04183389 INSPEC Abstract Number: B9208-0170J-007
Title: Factors in implementing MCM solutions for the high performance systems of the 1990s
Author(s): **Buschbom, M.L.**; Calvin, S.E.
Author Affiliation: Texas Instrum., Dallas, TX, USA
Conference Title: Proceedings of the IEEE 1991 Custom Integrated Circuits Conference (Cat. No.91CH2994-2) p.27.1/1-4
Publisher: IEEE, New York, NY, USA
Publication Date: 1991 Country of Publication: USA 756 pp.
ISBN: 0 7803 0015 7
U.S. Copyright Clearance Center Code: CH2994-2/91/0000-0145$01.00
Conference Sponsor: IEEE
Conference Date: 12-15 May 1991 Conference Location: San Diego, CA, USA
Language: English
Abstract: It is pointed out that the ability to package VLSI and ULSI circuits in a manner that causes minimum degradation to circuit performance and still meet the desired form-factors in the final system is a key challenge for the 1990s. Conventional packaging configurations are giving way to next-generation solutions with increased emphasis on interconnection technology, thermal management, mechanical issues, and board footprint. Processor roadmaps show 4* to 5* increases in operating frequency over the next five years, and commercial optical systems at 300 MHz are followed by lob versions operating at 1 GHz. Electronic system performance driving factors are discussed, and the resulting constraints for semiconductors, interconnection techniques (including tape automated bond and **flip chip**), mechanical design, and thermal approaches are addressed. Additional integration of VLSI and ULSI components in the form of modular systems solutions at the multichip module (MCM) level are being developed and produced at the laboratory level, and results are discussed.

17/3,AB/4 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

03473669
E.I. Monthly No: EIM9208-042992
Title: Factors in implementing MCM solutions for the high performance systems of the 1990s.
Author: **Buschbom, Milton L.**; Calvin, Sam E.
Corporate Source: Texas Instruments, Dallas, TX, USA
Conference Title: Proceedings of the IEEE 1991 Custom Integrated Circuits Conference
Conference Location: San Diego, CA, USA Conference Date: 19910512
E.I. Conference No.: 16672
Source: Proceedings of the Custom Integrated Circuits Conference. Publ by IEEE, IEEE Service Center, Piscataway, NJ, USA (IEEE cat n 91CH2994-2). p 4p
Publication Year: 1991
CODEN: PCICER ISSN: 0886-5930 ISBN: 0-7803-0015-7
Language: English
Abstract: It is pointed out that the ability to package VLSI and ULSI circuits in a manner that causes minimum degradation to circuit performance and still meet the desired form-factors in the final system is a key challenge for the 1990s. Conventional packaging configurations are giving way to next-generation solutions with increased emphasis on interconnection technology, thermal management, mechanical issues, and board footprint. Processor roadmaps show 4 multiplied by to 5 multiplied by increases in operating frequency over the next 5 years, and commercial optical systems at 300 MHz are followed by lob versions operating at 1 GHz. Electronic system performance driving factors are discussed, and the resulting constraints for semiconductors, interconnection techniques (including tape automated bond and **flip chip**), mechanical design, and thermal approaches are addressed. Additional integration of VLSI and ULSI components in the form of modular systems solutions at the multichip module (MCM) level are being developed and produced at the laboratory level, and results are discussed.

11/06/2002 09/992,387

17/3,AB/5 (Item 1 from file: 65)
DIALOG(R)File 65:Inside Conferences

02497033 INSIDE CONFERENCE ITEM ID: CN026061738
Reliability Data for **Flip Chip** on Flex
El-Ghor, M. K.; Blythe, D.; **Buschbom, M.**; Ding, L.
CONFERENCE: NEPCON West '98-Conference
NEPCON WEST, 1998; NUMBER 3 P: 1150-1160
Reed Exhibition Companies, 1998
LANGUAGE: English DOCUMENT TYPE: Conference Papers and programme
CONFERENCE LOCATION: Anaheim, CA
CONFERENCE DATE: Mar 1998 (199803) (199803)

17/3,AB/6 (Item 2 from file: 65)
DIALOG(R)File 65:Inside Conferences

02344290 INSIDE CONFERENCE ITEM ID: CN024534302
Application of **Flip Chip** in Hard Disk Drive Industry
El-Ghor, M. K.; **Buschbom, M.**; Thomas, S.; Moore, T.
CONFERENCE: Emerging technologies-Annual symposium; 4th
P: 113-118
Edina, SMTA, 1997
LANGUAGE: English DOCUMENT TYPE: Conference Papers
CONFERENCE SPONSOR: Surface Mount Technology Association
CONFERENCE LOCATION: Bloomington, MN
CONFERENCE DATE: Oct 1997 (199710) (199710)

11/06/2002 09/992,387

19/3,AB/4 (Item 1 from file: 65)
DIALOG(R)File 65:Inside Conferences

00436791 INSIDE CONFERENCE ITEM ID: CN004184890
Thermal Characteristics of QFP and **TAB** Packaged Parts For Board Applications
Buschbom, M. L.; Coyle, A.
CONFERENCE: Apart from the crowd-Conference
SURFACE MOUNT INTERNATIONAL -PROCEEDINGS-, 1993; VOL 2 P: 785-789
Surface Mount International, 1993
LANGUAGE: English DOCUMENT TYPE: Conference Papers
CONFERENCE SPONSOR: Surface Mount Technology Association
Institute for Interconnecting and Packaging Electronic Circuits
Electronics Industries Association
CONFERENCE LOCATION: San Jose, CA
CONFERENCE DATE: Aug 1993 (199308) (199308)
NOTE:

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19/3,AB/3 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

02908979
E.I. Monthly No: EI9006068169
Title: Multi-chip modules help sidestep costly fine pitch problems.
Author: **Buschbom, Milton L.**
Corporate Source: Semiconductor Group, Dallas, TX, USA
Source: Hybrid Circuit Technology v 7 n 1 Jan 1990 p 6-10
Publication Year: 1990
CODEN: HCTEEY ISSN: 0747-1599
Language: English
Abstract: The technology of earlier transistor-based hybrid circuits has set a foundation for today's advanced multi-chip modules. But that technology is taking on a new complexion with the advent of more advanced silicon substrates and a variety of **TAB** techniques. It comes at a time when systems manufacturers face the possibility of large investments to adapt to fine pitch technology. However, multi-chip modules (MCMs) with their conventional packaging will help stave off capital outlay and allow systems makers to continue utilizing the same manufacturing technologies. The topics discussed are the evolution of MCMs; silicon-based substrates; packaging technology; MCM applications; function cards; and MCM associated problems, issues, and challenges.

11/06/2002 09/992,387

19/3,AB/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

03691687 INSPEC Abstract Number: B90055023
Title: Multi-chip modules help sidestep costly fine pitch problems
Author(s): **Buschbom, M.L.**
Author Affiliation: Texas Instrum., Dallas, TX, USA
Journal: Hybrid Circuit Technology vol.7, no.1 p.6-10
Publication Date: Jan. 1990 Country of Publication: USA
CODEN: HCTEEY ISSN: 0747-1599
Language: English
Abstract: The technology of earlier transistor-based hybrid circuits has set a foundation for today's advanced multi-chip modules. But that technology is taking on a new complexion with the advent of more advanced silicon substrates and a variety of **TAB** techniques. It comes at a time when systems manufacturers face the possibility of laying out millions of dollars to streamline manufacturing resources to adapt to fine pitch technology. However, MCMs with their conventional packaging will help stave off capital outlay and allow systems makers to continue utilizing the same manufacturing technologies. In this regard, function cards-a branch of MCM-promise to take the industry toward system modules.

11/06/2002 09/992,387

19/3,AB/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

4658224 INSPEC Abstract Number: B9406-2210D-014
Title: Thermal characteristics of QFP and **TAB** packaged parts for board applications
Author(s): **Buschbom, M.L.**; Coyle, A.
Author Affiliation: Texas Instruments Inc., Dallas, TX, USA
p.785-9
Publisher: Surface Mount Int, Dallas, TX, USA
Publication Date: 1993 Country of Publication: USA 2 vol. 1031 pp.
Conference Title: Proceedings of Surface Mount International
Conference Date: 31 Aug.-2 Sept. 1993 Conference Location: San Jose, CA, USA
Language: English
Abstract: An understanding of semiconductor package thermal characteristics in board applications is critical for creation of controlled device junction temperature suitable for reliable systems. Experimental data are presented comparing the thermal capability of various quad flatpack (QFP) and tape automated bond (**TAB**) package configurations including leadframe materials, plastic package thermal spreader and thermal slug enhancements, and metal body package versions. Results of the comparison show that **TAB** packaged products can have thermal capability superior to most conventional plastic package configurations (including some thermally enhanced packages). Additionally, when very simple heat spreader or heatsink techniques are applied to **TAB** on board assemblies, heat removal can be superior to metal body packages and approach the level of the best thermally enhanced ceramic solutions with a large reduction in both cubic volume and weight. A conclusion is made that there are multiple possible package solutions that can be chosen to provide suitable package thermal management at the board/system level with the final package choice being a function of board assembly capability, system level thermal management requirements, space available, and desired weight.

23/3,AB/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC

03691687 INSPEC Abstract Number: B90055023
Title: Multi-chip modules help sidestep costly fine pitch problems
Author(s): **Buschbom, M.L.**
Author Affiliation: Texas Instrum., Dallas, TX, USA
Journal: Hybrid Circuit Technology vol.7, no.1 p.6-10
Publication Date: Jan. 1990 Country of Publication: USA
CODEN: HCTEEY ISSN: 0747-1599
Language: English
Abstract: The technology of earlier transistor-**based** hybrid circuits has set a foundation for today's advanced multi-chip modules. But that technology is taking on a new complexion with the advent of more advanced silicon **substrates** and a variety of TAB techniques. It comes at a time when systems manufacturers face the possibility of laying out millions of dollars to streamline manufacturing resources to adapt to fine pitch technology. However, MCMs with their conventional packaging will help stave off capital outlay and allow systems makers to continue utilizing the same manufacturing technologies. In this regard, function cards-a branch of MCM-promise to take the industry toward system modules.

11/06/2002 09/992,387

23/3,AB/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

4658224 INSPEC Abstract Number: B9406-2210D-014
Title: Thermal characteristics of QFP and TAB packaged parts for board applications
Author(s): **Buschbom, M.L.**; Coyle, A.
Author Affiliation: Texas Instruments Inc., Dallas, TX, USA
p.785-9
Publisher: Surface Mount Int, Dallas, TX, USA
Publication Date: 1993 Country of Publication: USA 2 vol. 1031 pp.
Conference Title: Proceedings of Surface Mount International
Conference Date: 31 Aug.-2 Sept. 1993 Conference Location: San Jose, CA, USA
Language: English
Abstract: An understanding of semiconductor package thermal characteristics in board applications is critical for creation of controlled device junction temperature suitable for reliable systems. Experimental data are presented comparing the thermal capability of various quad flatpack (QFP) and tape automated bond (TAB) package configurations including leadframe **materials**, plastic package thermal spreader and thermal slug enhancements, and metal body package versions. Results of the comparison show that TAB packaged products can have thermal capability superior to most conventional plastic package configurations (including some thermally enhanced packages). Additionally, when very simple heat spreader or heatsink techniques are applied to TAB on board assemblies, heat removal can be superior to metal body packages and approach the level of the best thermally enhanced ceramic solutions with a large reduction in both cubic volume and weight. A conclusion is made that there are multiple possible package solutions that can be chosen to provide suitable package thermal management at the board/system level with the final package choice being a function of board assembly capability, system level thermal management requirements, space available, and desired weight.

11/06/2002 09/992,387

23/3,AB/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

5849143 INSPEC Abstract Number: B9804-0170J-040, C9804-5320C-005
Title: Application of flip chip in hard disk drive industry
Author(s): El-Ghor, M.K.; **Buschbom, M.**; Thomas, S.; Moore, T.; Masumoto, K.; Okazaki, T.; Masumoto, M.
Author Affiliation: Texas Instrum. Inc., Dallas, TX, USA
Conference Title: SMTA National Symposium, Emerging Technologies. Proceeding of the Technical Program p.113-17
Publisher: Surface Mount Technol. Assoc, Edina, MN, USA
Publication Date: 1997 Country of Publication: USA 197 pp.
Material Identity Number: XX97-02909
Conference Title: Proceedings of 4th Annual New and Emerging Technologies for Surface Mounted Electronic Packaging
Conference Date: 20-23 Oct. 1997 Conference Location: Bloomington, MN, USA
Language: English
Abstract: Inherent advantages of flip chip technology for reduction in real estate, providing thin profiles, and improvement in speed and performance, played a key role in its application to several areas such as mainframes, automotive electronics, wireless devices, and hard disk drives. This paper reports on the application of flip chip in the hard disk drive industry. An excellent prototype method to evaluate initial bumped products is demonstrated by using stud bumping. In this method, a palladium core with solder stud forms the final interconnect bump between the chip and flex **substrate** . Structural and reliability data are presented. In production, eutectic solder bumps formed by electroplating using the fountain method are implemented. Structural and chemical characterization of the plated bumps are reported. Finally, issues and recommendations related to the assembly of flip chip on flex **substrates** are discussed.

11/06/2002 09/992,387

23/3,AB/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6128157 INSPEC Abstract Number: B1999-02-0170J-083
Title: Reliability data for flip chip on flex
Author(s): El-Ghor, M.K.; Blythe, D.; Nguyen, P.; Ding, L.; **Buschbom, M.**; Sadaike, S.; Kinoshita, M.; Masumoto, K.; Watanabe, M.
Author Affiliation: Texas Instrum. Inc., Dallas, TX, USA
Conference Title: Proceedings of the Technical Program. NEPCON West '98. Conference Part vol.3 p.1150-60 vol.3
Publisher: Reed Exhibition, Norwalk, CT, USA
Publication Date: 1998 Country of Publication: USA 3 vol. 1546 pp.
Material Identity Number: XX-1998-02004
Conference Title: Proceedings of NEPCON West 98
Conference Date: 1-5 March 1998 Conference Location: Anaheim, CA, USA
Language: English
Abstract: Advanced developments in interconnect technology are driven by fierce competition in various segments of semiconductor applications. New package schemes evolved to address aggressive requirements set forth by customers. Flip chip technology has been accepted generally by the electronics industry only during the past few years as a true solution to many current and future applications. In this work, it is shown that flip chip on flex is a reliable technology in hard disk drive applications. Reliability data is presented demonstrating zero failures in dynamic life, thermal cycling, latch-up, electrostatic discharge, protective overcoat integrity, corrosion/delamination, and solder ball shear testing. The reliability data obtained met customer requirements. The parts were thus qualified and used in production. This work demonstrates the high quality of both the bumping process and the assembly process on flex **substrates**.

11/06/2002 09/992,387

23/3,AB/10 (Item 2 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

02908979
E.I. Monthly No: EI9006068169
Title: Multi-chip modules help sidestep costly fine pitch problems.
Author: **Buschbom, Milton L.**
Corporate Source: Semiconductor Group, Dallas, TX, USA
Source: Hybrid Circuit Technology v 7 n 1 Jan 1990 p 6-10
Publication Year: 1990
CODEN: HCTEEY ISSN: 0747-1599
Language: English
Abstract: The technology of earlier transistor-**based** hybrid circuits has set a foundation for today's advanced multi-chip modules. But that technology is taking on a new complexion with the advent of more advanced silicon **substrates** and a variety of TAB techniques. It comes at a time when systems manufacturers face the possibility of large investments to adapt to fine pitch technology. However, multi-chip modules (MCMs) with their conventional packaging will help stave off capital outlay and allow systems makers to continue utilizing the same manufacturing technologies. The topics discussed are the evolution of MCMs; silicon-**based substrates**; packaging technology; MCM applications; function cards; and MCM associated problems, issues, and challenges.